

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following arguments is respectfully requested.

Claims 1-17 are pending in this application. No new matter is added.

In the outstanding Office Action, Claims 1, 2, and 10-17 are rejected under 35 U.S.C. § 103(a) as unpatentable over Crozier (U.S. Pat. No. 5,742,927) in view of Itoh et al. (U.S. Pat. No. 5,757,937, herein "Itoh"); Claims 3, 5 and 7 are rejected under 35 U.S.C. § 103(a) as unpatentable over Crozier and Itoh in view of Lockwood et al. (U.S. Pat. No. 6,477,489, herein "Lockwood"); and Claims 4, 6, 8 and 9 are rejected under 35 U.S.C. § 103(a) as unpatentable over Crozier and Itoh in view of Chan et al (U.S. Pat. No. 5,668,927, herein "Chan").

Addressing now the above-noted prior art rejections, those rejections are traversed by the present response.

Claim 1 recites, in part,

a noise-likeness analyzing unit which receives the input signal including the object signal and the noise mixed therein, and which performs linear predictive analysis to obtain linear predictive coefficients used to generate a low pass residual signal, and which performs correlation analysis on the low pass residual signal, and which determines the noise-likeness of the input signal frame;

Independent Claims 10, 11, 12, 14 and 16 recite similar features.

Crozier describes a noise reduction method for enhancing noisy speech signals in which the noise spectrum is estimated during periods of no speech in the input signal. These periods of no speech are recognized by a voice activity detector 5 which produces a control signal that initiates storing the signal in store 6 when no speech is present. The signal in store 6 is processed and after processing the contents of the store 6 represents the current estimate of the short term power spectrum.

In contrast, Claim 1 recites a noise-likeness analyzing unit which receives the input signal including the object signal and the noise mixed therein and which determines the noise-likeness of the input signal frame.

The outstanding Office Action acknowledges on page 4, in the first paragraph, that Crozier does not describe or suggest a noise-likeness analyzing unit which performs linear predictive analysis to obtain linear predictive coefficients used to generate a low pass residual signal, and which performs correlation analysis on the low pass residual signal. However, on page 3, beginning in line 1, the outstanding Office Action states that Crozier, in references 5 and 6, discloses “a noise-likeness analyzing unit which receives the input signal including the object signal and the noise mix therein and determines the noise-likeness of the input signal frame references.” Applicants traverse this assertion.

In col. 3 of Crozier, reference 5 is described as a “voice activity detector”, in other words a speech detector. Reference 6 is described as a store, in other words a memory or a storage area. The noise-likeness of the input signal is defined in the present specification as a noise likeness level calculated on the basis of a positive peak value, a power of the low pass residual signal of the present frame and a power in all over the frequency region of the signal of the present frame.¹ The voice activity detector 5 and store 6 do not disclose calculating a noise-likeness level. Therefore Claim 1 patentably distinguishes over Crozier.

The outstanding Office Action relies on Itoh as curing the above noted deficiencies of Crozier.

Itoh describes an acoustic noise suppressor in which an analysis/discrimination part 20 is used to determine if the input signal is speech or noise for each fixed analysis period.² Further, Itoh describes that the input signal is sent through a LPC analysis part 22 to isolate the human voice in the signal. Then the LPC analyzed signal is sent through an

¹ Specification, page 12, lines 6-14.

² Itoh, col.5, lines 26-35.

autocorrelation analysis part 23 to determine a peak value used to identify if the signal is speech or not speech.

However, Itoh does not describe *generating a low pass residual signal*, and performing correlation analysis on the *low pass residual signal*. Additionally, Itoh does not describe or suggest determining the noise-likeness of the input signal frame references. Thus, as Itoh does not disclose the above noted features of Claim 1, Itoh does not cure the deficiencies of Crozier as noted above.

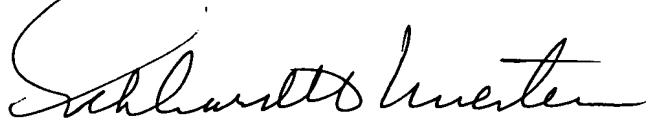
In such ways, applicants respectfully submit that Itoh does not overcome the recognized deficiencies of Crozier with respect to the claimed features as currently written. Thereby, each of the claims is believed to distinguish over the combination of teachings of Crozier and Itoh taken alone or any proper combination.

Moreover, with respect to the further dependent claims, applicants respectfully submit those claims also distinguish over the applied art, particularly as none of these further cited teachings to Lockwood or Chan are believed to overcome the above-noted deficiencies of Crozier in view of Itoh.

As no other issues are pending in this application, it is respectfully submitted that the present application is now in condition for allowance, and it is hereby respectfully requested that this case be passed to issue.

Respectfully submitted,

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